

# ADP-Ribosylating Toxins and G Proteins

## Insights into Signal Transduction

Edited by **Joel Moss** and **Martha Vaughan**, *National Heart, Lung, and Blood Institute, National Institutes of Health, Bethesda, Maryland*

**T**he contents of this important synthesis and the expert contributors span the disciplines of microbiology, biochemistry, molecular biology, and pharmacology to review current knowledge about ADP-ribosylating toxins, guanine nucleotide-binding proteins, receptors, and signal transduction. Recombinant DNA technology has been applied to elucidate the molecular basis of action of these bacterial toxins, which are responsible in part for the syndromes characteristic of a number of infectious diseases.

This book will very effectively update interested scientists and students on the current status of research into ADP-ribosylating toxins and related topics and will point the way for future advances.

### CONDENSED CONTENTS

**I. Bacterial ADP-Ribosyltransferases: Toxins and Related Proteins** (9 chapters by Collier, Bodley and Veldman, Wick and Iglewski, Ui, Aktories and Just, Aktories et al., Mekalanos and DiRita, Fishman, and Murphy and Strom)

**II. Guanine Nucleotide-Binding Proteins Coupled to Signal Transduction in Animal Cells** (13 chapters by Raymond et al., Kaziro, Spiegel, Birnbaumer et al., De Vivo and Gershengorn, Snyderman et al., Serventi et al., Manning, Gautam and Simon, Gibbs et al., Price et al., Takai et al., and Boback et al.)

**III. ADP Ribosylation in Bacteria and Animal Cells** (6 chapters by Lowery and Ludden, Jacobson et al., Williamson and Moss, Iglewski and Fendrick, Ueda, and Miwa and Sugimura)

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Editors: **Charles L. Hershberger** and **Stephen W. Queener**, *Eli Lilly & Co., Indianapolis, Indiana*, and **George Hegeman**, *Indiana University, Bloomington*

This far-reaching volume has been produced in recognition of recent advances in our understanding of bacterial and nonbacterial microbial systems in industry, including a great deal of new interest in products of eucaryotic microorganisms, and of the true industrial status of recombinant organisms. It brings together the work of leading researchers moving to maximize the industrial potential of recombinant DNA technology. The contents, summarized below, are based on the Fourth ASM Conference on the Genetics and Molecular Biology of Industrial Microorganisms (popularly known as the "Bloomington Conference"), held in 1988.

## CONDENSED CONTENTS

- I. **Perspectives with Industrial Microorganisms** (4 chapters by Demain, Hopwood, Cundliffe, and Archer et al.)
- II. **Biosynthesis of Macrocyclic Lactones** (4 chapters by Epp et al., Richardson et al., Streicher et al., and Donadio et al.)
- III. **Genes for Antibiotic Resistance and Biosynthesis** (4 chapters by Mansouri et al., Strohl et al., Donovan et al., and Suárez et al.)
- IV. **Genes for Developmental and Biosynthetic Pathways** (4 chapters by Chater, Champness et al., Schottel et al., and Tiraby et al.)
- V. **Genetic Structure and Plasticity in Streptomyces** (4 chapters by Cullum et al., Schrempf et al., Kinashi, and Hershberger et al.)
- VI. **Genetic Analysis and Manipulation in Streptomyces** (4 chapters by Stuttard, Baltz and McHenney, Chung and Crose, and Beckmann et al.)
- VII. **Applications of Dividing Bacteria** (4 chapters by Lazarus et al., Wubbolts and Timmis, DeVault et al., and Reeve)
- VIII. **Heterologous Protein Products from Cell Culture** (2 chapters by Kellems et al. and Grinnell et al.)
- IX. **Molecular Studies in  $\beta$ -Lactam-Producing Fungi and Streptomyces** (5 chapters by Jensen et al., Miller and Ingolia, Peñalva et al., Veenstra et al., and Baldwin et al.)
- X. **Molecular Biology and Regulation in Filamentous Fungi** (5 chapters by Marzluf and Fu, Ward, Finkelstein et al., Devchand et al., and Hynes and Andrianopoulos)
- XI. **Expression of Heterologous Proteins in Yeasts** (5 chapters by Meyhack et al., Thim et al., Bitter, Shuster et al., and Cregg et al.)

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Published in the *International Journal of Systematic Bacteriology* since the  
1980 *Approved Lists of Bacterial Names* (1 January 1980 to 1 January 1989)

W. E. C. Moore and Lillian V. H. Moore

ORIGINALLY PUBLISHED in 1980 in the *International Journal of Systematic Bacteriology*, the *Approved Lists of Bacterial Names* includes all valid names of bacteria which, through 1979, had been adequately described and, if cultivable, for which there was a type, neotype, or reference strain available. It has been reproduced in hardcover with minor corrections and a more "user friendly" format. The *Index of the Bacterial and Yeast Nomenclatural Changes* is a new softcover adjunct volume to the *Approved Lists*, which provides a complete and orderly compilation of nomenclatural changes that have occurred from 1 January 1980 through 1 January 1989. These complementary volumes are not sold separately; they are available only as a set.

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# *Pseudomonas*

## BIOTRANSFORMATIONS, PATHOGENESIS, AND EVOLVING BIOTECHNOLOGY

Edited by **Simon Silver** and **Ananda M. Chakrabarty**, *University of Illinois College of Medicine, Chicago*; **Barbara Iglewski**, *University of Rochester, Rochester, New York*; and **Samuel Kaplan**, *University of Texas Medical School, Houston*

**S**cientific interest in the genus *Pseudomonas* is now as multifaceted as the organisms themselves. Pseudomonads are variously pathogens of plants and animals, including humans; producers of siderophores which are beneficial to plants; natural scavengers whose activity results in biodegradation and removal of many natural and synthetic compounds; extremely useful systems for the study of metabolic pathways, gene structure, and gene expression; and producers of interesting industrial products. Because *Pseudomonas* species are so extremely important, there has been an explosive growth in research and information during the past several years, and state-of-the-art research methods are being applied to their fullest potential in these investigations.

All major aspects of *Pseudomonas* research, as well as investigations of several closely related bacteria, are encompassed in this review of the field, which had its origins in the third international symposium, "Pseudomonas 89," held in Chicago, Ill. Included are reviews of biochemical, biophysical, genetic, and molecular studies. What emerges is a true reflection of the extraordinary amount and types of available information on this important genus.

### CONDENSED CONTENTS

#### Preface (Silver)

#### Introduction (Silver and Chakrabarty)

- I. Pathogenesis** (4 chapters by Vasil et al., Zielinski et al., Ohman et al., and Iglewski et al.)
- II. Plant-Bacterial Interactions** (6 chapters by Mills and Mukhopadhyay, Chatterjee et al., Weisbeek et al., Mindrinos et al., Schott et al., and Keller et al.)
- III. Biotransformations** (12 chapters by Davies et al., Furukawa et al., Gibson et al., Nakazawa et al., Witholt et al., Rodwell et al., Davison et al., Schell, Burns et al., Schlömann et al., Spain, and Ornston et al.)
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- V. Cell Envelope and Transport** (5 chapters by Trias and Nikaido, Siehnel et al., Paranchych et al., Sano et al., and Cervantes and Silver)
- VI. Honorary Pseudomonads** (4 chapters by Penfold and Pemberton, Neilands, Kaplan and Suwanto, and Friedrich et al.)

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Edited by **Issar Smith**, *Public Health Research Institute, New York, N.Y.*,  
**Ralph A. Slepecky**, *Syracuse University, Syracuse, N.Y.*, and  
**Peter Setlow**, *University of Connecticut Health Center, Farmington*

The process of differentiation, by which a cell of one type gives rise to cells with a different morphology, physiology, and function, raises some of the most important questions in modern biology. This book presents an up-to-date review of current research on differentiation in procaryotes, especially in *Bacillus* and *Streptomyces* species, of which sporulation is the best studied example of this process. Other phenomena, i.e., the production of extracellular enzymes, antibiotics, and other secondary metabolites such as anti-insect spore crystals, all of which are of commercial importance, are reviewed. Thus, a nearly comprehensive picture of this spore field is given. Authors with specific expertise in the areas covered were chosen so that the emphasis would be on aspects not yet covered in detail or about which another viewpoint might be useful.

Microbiologists, biotechnologists, scientists in the food and pharmaceutical industries, molecular biologists, and workers interested in cellular differentiation will greatly benefit from this book, arising from the Tenth International Spores Conference, March 1988.

### CONTENTS

1. Revised Genetic Map of *Bacillus subtilis* 168 (Pigot)
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3. Genetic Manipulation, Cloning, and Functional Analysis of Sporulation Genes in *B. subtilis* (Youngman et al.)
4. Trigger Mechanism of Bacterial Spore Germination (Foster and Johnstone)
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## PHYSICAL AND GENETIC MAP OF *ESCHERICHIA COLI*

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## *ESCHERICHIA COLI* LINKAGE MAP

### *Call for reprints*

The 1990 *E. coli* linkage map, edition 8, is 2 years out of date at the time of publication. One of the major problems in revising the map is that of obtaining copies of all the papers containing mapping data. While edition 8 was being prepared, the Yale University science libraries cancelled their subscriptions to many journals, and they cannot afford to subscribe to many new ones. It would be immensely helpful if authors of papers containing mapping data of any sort would send to me reprints of their papers from all journals other than the *Journal of Bacteriology*. This might permit publication of map revisions in a more timely fashion.

**Barbara J. Bachmann**  
Department of Biology  
OML 355  
Yale University  
P.O. Box 6666  
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# *ESCHERICHIA COLI* AND *SALMONELLA* *TYPHIMURIUM* CELLULAR AND MOLECULAR BIOLOGY

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